SECTION A

QUESTION 1

1.1  
1.1.1  A √√
1.1.2  A √√
1.1.3  C √√
1.1.4  D √√
1.1.5  C √√
1.1.6  B √√
1.1.7  B √√
1.1.8  C √√
1.1.9  B √√
1.1.10 C/D √√  (10 x 2) (20)

1.2  
1.2.1  B only √√
1.2.2  A only √√
1.2.3  Both A and B √√
1.2.4  B only √√
1.2.5  None √√  (5 x 2) (10)

1.3  
1.3.1  Bile √√
1.3.2  Insulation/ventilation √√
1.3.3  Vector √√
1.3.4  Dystocia √√
1.3.5  Impotence √√  (5 x 2) (10)

1.4  
1.4.1  Fodder flow/feed flow ✓
1.4.2  Free-range/semi intensive/backyard ✓
1.4.3  Per acute/acute ✓
1.4.4  Layers ✓  (5 x 1) (5)
1.4.5  Mesoderm ✓

TOTAL SECTION A:  45
section b

question 2: animal nutrition

2.1 diagram of a digestive system

2.1.1 identify the type of farm animal
monogastric animal/non-ruminant animal ✓ (1)

2.1.2 motivation for question 2.1.1
monogastric/simple stomach ✓ (1)

2.1.3 identification of the letters
(a) e ✓
(b) c ✓
(c) d ✓ (3)

2.1.4 reasons for not feeding roughage
• Monogastric/simple stomach ✓
• No cellulose-digesting microbes/flora ✓
• Cannot digest roughage ✓ (any 2) (2)

2.2 water, vitamins and minerals

2.2.1 functions of water
• Acts as a solvent/assists in the absorption of nutrients ✓
• Protects some sensitive tissue/serves as a lubricant ✓
• Moisturising the swallowed food/feed ✓
• Provides a suitable environment for microbes/flora ✓
• Mechanical digestion in mouth/swallowing ✓
• Prevents constipation ✓
• Assists in the transportation of nutrients ✓
• Excretion of waste products ✓ (any 3) (3)

2.2.2 vitamin/mineral deficiencies
(a) vitamin d/calcium/ca/phosphorus/p/copper/cu ✓
(b) vitamin a/retinol ✓
(c) iodine/i ✓
(d) iron/fe/vitamin b6/b12/copper/cu/cobalt/co ✓ (4)
2.3 Digestibility co-efficiency

2.3.1 Calculation:  
\[ \text{8\% (0,08) x 30 kg = 2,4 kg} \]  
\[ \text{Dry material: 30 kg - 2,4 kg = 27,6 kg} \]

\[ \text{DC = } \frac{\text{Dry material intake (kg) - Dry mass of manure(kg)}}{\text{Dry material intake (kg)}} \times 100 \]

\[ = \frac{27,6 \text{ kg} - 12 \text{ kg}}{27,6 \text{ kg}} \times 100 \]

\[ = \frac{15,6}{27,6} \times 100 \]

\[ = 56,5/57 \% \]

(5)

2.3.2 Processes to improve digestibility of feeds
- Mechanical processes/grinding/milling/crushing/rolling ✓
- Pelleting ✓
- Heating/roasting/boiling/cooking/steaming ✓
- Additives/supplementing with NPN/molasses/treating feed with dilute caustic soda (NaOH) solution ✓
- Soaking ✓
- Popping and micronising ✓
- Mixing of complementary feeds ✓

(Any 3)

(3)

2.4 Pearson square

2.4.1 Calculation:  
Maize 9%  
\[ \text{27/27 parts} \]

\[ \text{17\%} \]

Peanut oilcake 44%  
\[ \text{8/8 parts} \]

(3)

2.4.2 Maize percentage to be included in the ration
\[ 27 \div 35 \times 100 \]

\[ = 77,14/77\% \]

(2)
2.5 Feed and supplement supply

2.5.1 Months when there was sufficient veld fodder
- December ✓
- January ✓

2.5.2 Justification
- No supplementation during the two months ✓
- Only veld fodder was used during the two months ✓ (Any 1)

2.5.3 Reasons for introducing a concentrate
- Animals are prepared/fattened/rounding off for the market ✓ ✓
- Getting animals ready for breeding ✓ ✓
- For the lambing season ✓ ✓
- Insufficient veld fodder ✓ ✓ (Any 1)

2.5.4 Calculation of the fodder for January:
(a) 3,4 tons x 1 000 = 3 400 kg ✓
(b) 50 sheep x 2 kg intake per sheep x 31 days ✓
= 3 100 kg ✓

QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

3.1 Production systems

3.1.1 Production systems
A - Extensive ✓
B - Intensive ✓

3.1.2 Comparison of the two systems

<table>
<thead>
<tr>
<th></th>
<th>Extensive/A</th>
<th>Intensive/B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment</td>
<td>No/limited/less control ✓</td>
<td>Environment is modified or controlled for production purposes ✓</td>
</tr>
<tr>
<td>Productivity</td>
<td>Low/less productivity ✓</td>
<td>High/more productivity ✓</td>
</tr>
<tr>
<td>Human input</td>
<td>Low/minimal/less ✓</td>
<td>High/more ✓</td>
</tr>
</tbody>
</table>

3.1.3 Reason for keeping cattle in the facility
- Higher productivity/output/efficiency ✓
- An environment for feeding/nutrition/protection/control ✓ (Any 1)
3.2 Farm animals loosing heat

3.2.1 Ways in which animals lose heat
- A: Radiation/evaporation/perspiration ✓
- B: Conduction ✓
- C: Excretion/defecation ✓

3.2.2 Other ways of heat loss
- Convection ✓
- Movement/work ✓
- Production level ✓
- Urination ✓
- Breathing ✓

3.2.3 Signs of heat stress in animals
- Excessive salivation/drooling ✓
- Drop/decrease in production ✓
- Excessive panting/high respiratory rate/sweating ✓
- Open mouth breathing with tongue hanging out ✓
- Loss of appetite ✓
- Cattle move away from each other ✓
- Restlessness ✓

3.2.4 Management practice to reduce heat in A
- Provision of shelter/shade/cool area ✓
- Breeding of heat adapting animals ✓
- Use of mechanical cooling systems ✓
- Work calmly with animals ✓
- Access to drinking water ✓

3.3 Pulse and respiratory rate of farm animals

The average pulse and respiratory rate of farm animals

Pulse rate

Respiratory rate

Farm animals

Cattle
Horse
Sheep
Goat
Pig

Pulse- and respiratory rate (per min.)
Mark allocations
• Correct heading ✓
• Line graph ✓
• X-axis correctly calibrated/labelled (Species of farm animals) ✓
• Y-axis correctly calibrated/labelled (Pulse and respiratory rates) ✓
• Accuracy/correct values/plotting/both graphs must be correct ✓
• Correct units (per min.) ✓

3.4 Vaccination plan

3.4.1 Appropriate words/terms for letters A to G
A Anthrax ✓
B Cattle/sheep/goats ✓
C Protozoa ✓
D Cattle/sheep/goats ✓
E Blisters on the tongue/nose/lips/mouth/teats/udder/
   between the toes/around hooves ✓
F Annually/once a year ✓
G Virus ✓

3.4.2 Vector for redwater
Ticks ✓

3.5 Control of parasites

Appropriate method used to administer remedies

3.5.1 Dosing/drenching/injecting/provision of licks ✓

3.5.2 Dipping/spraying/spot treatment/injecting ✓

3.5.3 Cleaning/apply ointments/medication/apply insecticides/dipping ✓

QUESTION 4: ANIMAL REPRODUCTION

4.1 Embryo development

4.1.1 Stages of parturition as in pictures A and B
A - Ejection/expulsion ✓
B - Preparatory ✓

4.1.2 Incorrect posture of the calf
• Picture B/B ✓

Reason
• Retention of one leg towards the vulva/second leg is folded back ✓
4.1.3 Letter that corresponds with the following activities
(a) B ✓ (1)
(b) A ✓ (1)
(c) A ✓ (1)

4.1.4 Behavioural changes
• Restlessness/walks around/in pain and discomfort ✓
• Loss of appetite ✓
• Isolation/nesting behaviour ✓
• Tail raising ✓
• Lows often/bellowing noises ✓
• Frequent urination ✓ (Any 3) (3)

4.2 Graph that represents hormones in the oestrus cycle of a cow

4.2.1 Definition of oestrus cycle
• Hormonally-controlled cycle of activity ✓
• of the female reproductive organs ✓
  OR
• Recurring periods of oestrus ✓
• alternating with sexual rest in the matured female ✓ (Any 1) (2)

4.2.2 Range of days in which progesterone level is the highest
• From day 9/10 to day 15/16 (indicate any two days within the range) ✓ (1)

4.2.3 Reason for the drop in the level of FSH between days 2 and 3
Oestrogen levels is at its peak/high/went up ✓ (1)

4.2.4 Reason for the increased progesterone levels on days 3 and 4
• Fertilisation has taken place ✓✓
  OR
• Corpus luteum has been formed ✓✓ (Any 1) (2)

4.2.5 Influence of oestrogen on LH
• Oestrogen stimulates the release of LH ✓ (1)

4.2.6 The structure where prolactin is produced
• Pituitary gland/Hypophysis ✓ (1)

4.3 Detection of oestrus

The device to which each of the following statements apply:

4.3.1 Pedometer ✓ (1)

4.3.2 Chin-ball markers ✓ (1)

4.3.3 Tail-chalking ✓ (1)
4.4 Diagrams that represents a reproductive process

4.4.1 Reproductive process

- Cloning/nuclear transfer ✓ (1)

4.4.2 Definition of cloning

- A process through which an identical copy of the donor animal is produced ✓
- from its nucleus ✓ (2)

4.4.3 Description of stage B

- Removal of the nucleus ✓ (1)

4.4.4 Aims of cloning

- Produce large numbers of genetically identical animals ✓
- Production of offspring from a higher quality animal ✓
- Preservation of superior genetics/characteristics ✓
- Increase the population size of endangered species ✓
- Achieve high quality meat and dairy products ✓
- For medical purposes ✓ (Any 3) (3)

4.5 Diagram on oogenesis

4.5.1 Type of process

Oogenesis/ovigenesis ✓ (1)

4.5.2 Type of cell division

Mitosis ✓ (1)

4.5.3 Explanation for meiotic division

To form haploid cells/gametes ✓ (1)

4.5.4 End products of division of oogenesis and spermatogenensis

(a) Ova/egg cells ✓ (1)

(b) Spermatozoa/sperm cells ✓ (1)

4.5.5 The organ where the following are found

(a) Testis ✓ (1)

(b) Ovary ✓ (1)

[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150